

OTTAWA HULL EIA OCS

(11) (C)	1,334,458
(21)	601,353
(22)	1989/05/31
(45)	1995/02/14
(52) C.L. CR.	400-7904 134-47

BREVETS MARQUES DE COMMERCE

Daoits D'AUTEUR (51) Intl.Cl. B01F-017/00

DESSINS INDUSTRIELS TOPOGRAPHIES

(19) (CA) CANADIAN PATENT (12)

PATENTS TRADE-MARKS

INTÉGRÉS

(54) Process for Forming Low-Viscosity Emulsions of Polar

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INDUSTRIAL DESIGN INTEGRATED CIRCUIT

TOPOGRAPHY

Oils in Water

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- (73) Henkel Kommanditgesellschaft auf Aktien , Germany (Federal Republic of)
- (30) (DE) Germany (Federal Republic of) P 38 19 193.8 1988/06/06
- (57) 44 Claims

NO DRAWING



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## Abstract of the Disclosure

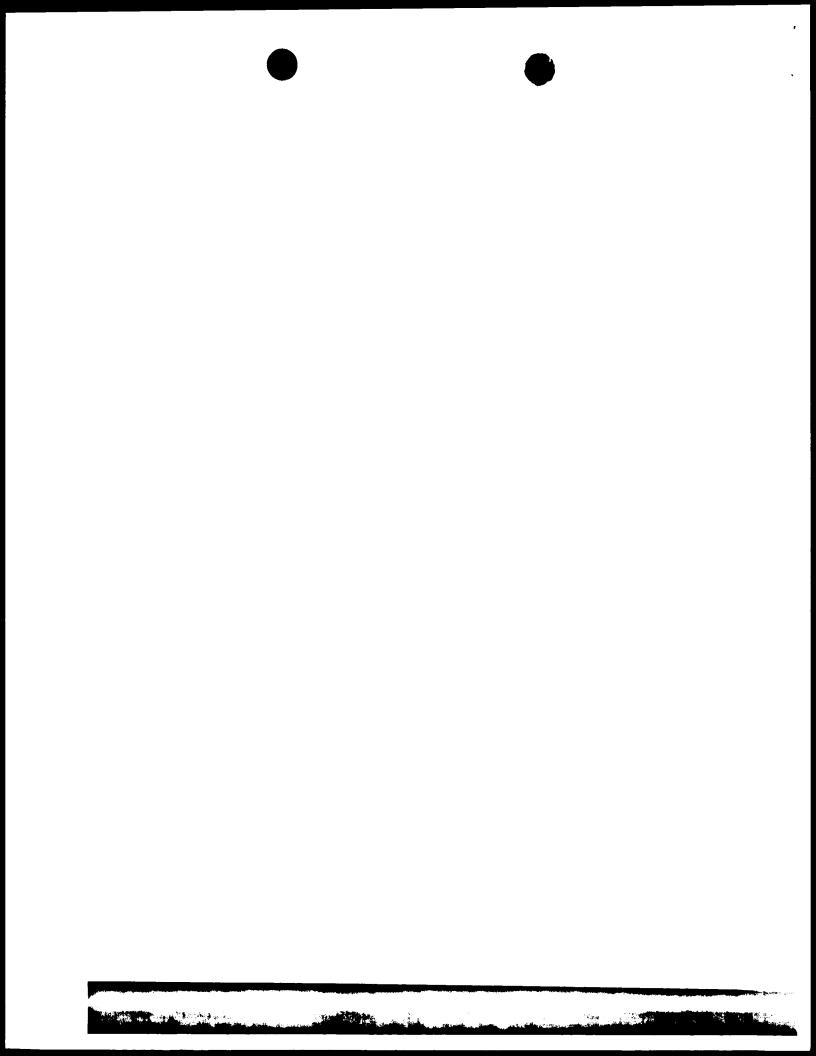
Low-viscosity oil-in-water emulsions of oils that are at least 50 % by weight monoesters and diesters containing at least 10 carbon atoms and may also contain up to 50% by weight of aliphatic acid triglycerides and/or up to 25% by weight of hydrocarbon oils may be 5 prepared by emulsification with 0.1 to 0.5 part by weight - per part by weight of the oil component - of an emulsifier having an HLB value of 11 to 12 and, preferably, also with 0.1 to 0.5 part by weight - per part by weight of the oil component - of a co-emulsifier 10 of the saturated aliphatic alcohol or aliphatic acid/polyol partial ester type. The emulsion, which contains at least 1 part by weight of water per part by weight of oil component, is prepared at a temperature above the melting point of the mixture of oil component, 15 emulsifier, and co-emulsifier if used, by a process that includes heating the mixed components to a temperature within or above the phase inversion temperature range, subsequently cooling the emulsion to a temperature below the phase inversion temperature range and, optionally, 20 further diluting the emulsion with water.



## BODIMENTS OF THE INVENTION IN WHICH

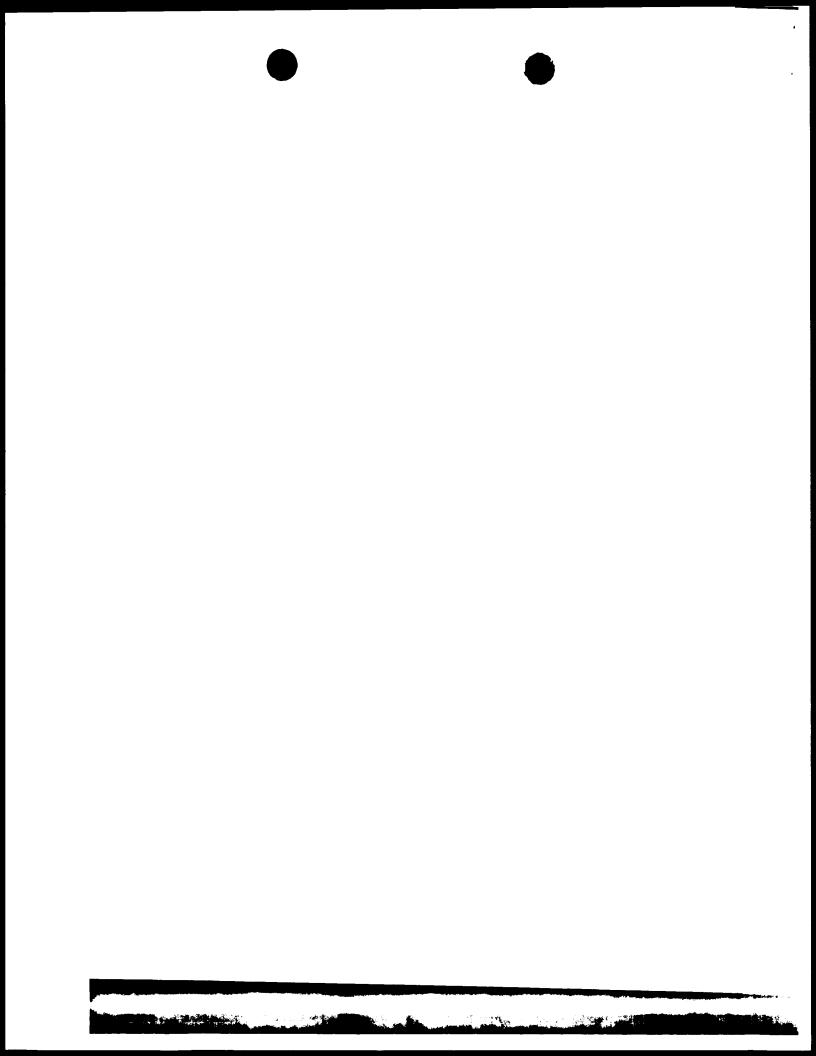
EXCLUSIVE AS FOLLOWS:

	-	tion of an oil-in-water
1.	1.	A process for the preparation of an oil-in-water
2		A process for the preparation of the preparation which inverts at temperatures below 100°C, emulsion which inverts at temperatures below 100°C, essentially of:
3		component (A) consisting continue
4		(1) 50 to 100% by Weight of molio of all library
5		molecules that contain at least 10 carbon
6		atoms and that correspond to one of the
7	•	formulae R <sup>1</sup> COOR <sup>2</sup> , R <sup>2</sup> OOC-R <sup>3</sup> -COOR <sup>2</sup> , and R <sup>1</sup> COO-R <sup>3</sup> -
8		oock, in which each of R <sup>1</sup> and R <sup>2</sup> independently
9		represents a C <sub>1-22</sub> alkyl group or C <sub>8-22</sub> alkenyl
10		group and R <sup>3</sup> represents a C <sub>2-16</sub> alkylene group;
11		(A.2) up to 50% by weight of aliphatic acid
12		triglycerides of C <sub>8-22</sub> aliphatic acids; and
13		(A.3) up to 25% by weight of hydrocarbon molecules,
14		said process comprising the steps of:
15		(I) forming, at a temperature sufficiently high
16		that all components are present in liquid
17		phase, an emulsion consisting essentially of:
18		a selected quantity of component (A);
19		a quantity of water having a weight at
20		least equal to the selected quantity of
21		component (A); and
22		(B) about 0.1 to about 0.5 part by weight, per
23		part by weight of component (A), of a
24		primary emulsifier component having an HLB
25		value of 11 to 12 and consisting of
26		molecules selected from the group
27		consisting of
28		(B.1) adducts of ethylene oxide with C <sub>16-22</sub>
29		aliphatic alcohols and
30	ı	(B.2) adducts of ethylene oxide with
31	-	partial esters between C3-6 polyols
32	<b>:</b>	and C <sub>14-22</sub> aliphatic acids;
33		(II) exposing the emulsion formed in step (I) to a
34		temperature within its phase inversion
35		temperature range; and
3 (		(III) cooling the emulsion formed in step (II) below
3.	-	its phase inversion temperature range.

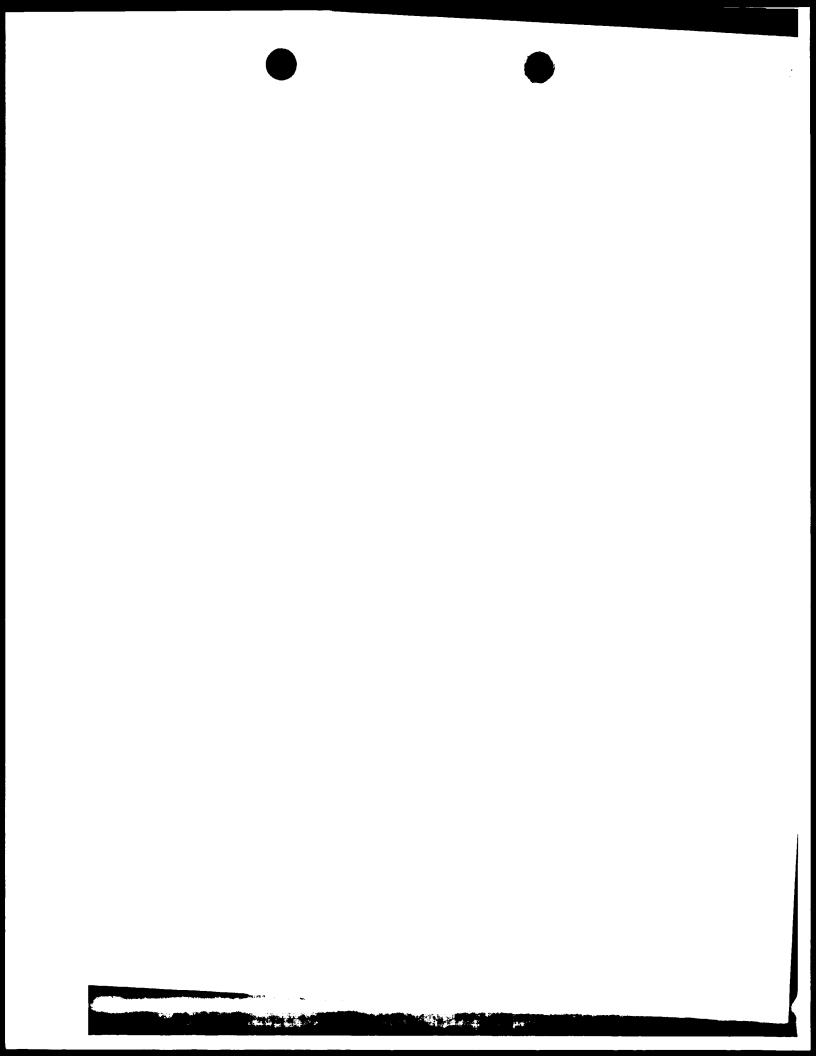


	a ha preparation of an oll-in-water
ī 2.	A process for the preparation of an oil-in-water  A process for the preparation of an oil-in-water  emulsion which inverts at temperatures below 100°C,  emulsion which inverts at temperatures below 100°C,  emulsion which inverts at temperatures below 100°C,
2	emulsion which inverts at temperature of:  of an oil component (A) consisting essentially of:  of an oil component (A) consisting essentially of:
3	of an oil component (A) consistency  (A.1) 50 to 100% by weight of mono- or di-ester  (A.1) 50 to 100% by weight at least 10 carbon
4	(A.1) 50 to 100% by weight of motion molecules that contain at least 10 carbon molecules that contain at least 10 carbon to one of the
5	atoms and that correspond to one of the
6	atoms and that correspond to one atoms and that correspond to one atoms and R1coo-R3- formulae R1cooR2, R2coc-R3-cooR2, and R1coo-R3-
7	
8	oock, in which each of k and occupance alkenyl represents a C1-22 alkyl group or C8-22 alkenyl represents a C1-22 alkylene group;
9	represents a C <sub>1-22</sub> alkyl gloup alkylene group; group and R <sup>3</sup> represents a C <sub>2-16</sub> alkylene group;
10	
11	(A.2) up to 50% by weight of alliphatic acids; and triglycerides of C <sub>8-22</sub> aliphatic acids; and
12	triglycerides of C <sub>8-22</sub> all photostrians the steps of:
13	(A.3) up to 25% by Weight of the steps of:
14	(A.3) up to 25% by the steps of: said process comprising the steps of: (I) forming, at a temperature sufficiently high  (I) forming, at a temperature present in liquid
15	
16	
17	
18	
19	a quantity of water navers least equal to the selected quantity of
20	
21	component (A);  (B) about 0.1 to about 0.5 part by weight, per
22	
23	empleifier component
24	
25	value of 11 to 12 and consider the essentially of molecules selected from the
26	
27	an adducts of ethylene oxid
28	Li = 1 CONOIS GIM
29	-f othylene Oxide with
30	LIA DETATE DECHOOS JO -
31	A LUNE A FIG ACTUS / MANY
32	o 6 nart by weight
33	
34	manant College
35	tially of molecules selected
36	group consisting of:
37	<b>3-</b> •

A



	155125
•	aliphatic alcohols;
•	(C.1) saturated C <sub>16-22</sub> aliphatic alcohols;
<sup>-</sup> 38	and polyots with
39	(C.2) partial esters of 330 acids;
40	saturated of the step (I) to the
41	saturated C <sub>14-22</sub> aliphatic dollars saturated C <sub>14-22</sub> aliphatic dollars saturated C <sub>14-22</sub> aliphatic dollars as saturated C <sub>14-22</sub> as saturated C <sub>14-22</sub> aliphatic dollars as saturated C <sub>14-22</sub>
42	
43	tomperature range, and in step (11)
44	(II) cooling the emulsion formed in cooling the emulsion temperature range.  its phase inversion temperature range.  additionally
45	, 1010101011 - Adit.101011
46	according to the state of the s
1	rising a scep ' and in step (1117)
2	in -in-waterin Drimari
3	tially of
1	4. A process according emulsifier component (B) consists essentiately emulsifier component (C) and emulsion (C) and emuls
2	emulsifier components  molecules that are adducts of 8 to 12 molecules  molecules that
3	molecules oxide with saturated C16-22
4	molecules.
5	anding to Claim " antially OI
1	5. A process according to claim 2, wherein 7  a process according to claim 2, wherein 7  b process according to claim 2, wherein 7  a process according to claim 2, wherein 7  b process according to claim 2, wherein 7  consists essentially of 2  emulsifier component (B) consists essentially of 3  emulsifier component (B) consists
2	emulsifier coare adducts of 8 to 12 mighatic alcohol
3	emulsifier components of 8 to 12 moreons molecules that are adducted to 16 moreons molecules that
4	ethylene oxidaty
5	molecules.  A process according to claim 1, wherein primary  6. A process according to claim 1, wherein primary  1
	6. A process according to consists essentially
	emulsifier coard  emulsifier coard  molecules that are adducts of 8 to 12 metric  molecules that are adducts of 8
	athylene Oxlue "
	Augustan Musican
	according of molecular
	component (A) consists that
	1 7. A process accomponent (A) consists essentially of molecules and component (A) consists essentially of molecules that component (B) consists essentially of molecules of ethylene oxide
	selected from Clabburgh Select
	are adducts of aliphatic alcohol
	with one saturated C20-22
	6



- 8. A process according to claim 4, wherein component

  (A) consists essentially of molecules selected from

  classes (A.1) and (A.2) only and component (B)

  classes (a.1) and (a.2) only and component (B)

  consists essentially of molecules that are adducts

  consists essentially of molecules of with one

  of 8 to 12 molecules of ethylene oxide with one

  saturated C<sub>20-22</sub> aliphatic alcohol molecule.
  - 9. A process according to claim 3, wherein component

    (A) consists essentially of molecules selected from

    classes (A.1) and (A.2) only and component (B)

    classes (A.1) and (A.2) only and component one

    consists essentially of molecules that are adducts

    consists essentially of molecules of with one

    of 8 to 12 molecules of ethylene oxide with one

    saturated C<sub>20-22</sub> aliphatic alcohol molecule.
    - 1 10. A process according to claim 1, wherein component

      (A) consists essentially of molecules selected from

      classes (A.1) and (A.2) only and component (B)

      classes (A.1) and (A.2) only and component on the consists essentially of molecules that are adducts

      consists essentially of molecules of ethylene oxide with one

      of 8 to 12 molecules of ethylene oxide with one

      saturated C<sub>20-22</sub> aliphatic alcohol molecule.
      - 1 11. A process according to claim 9, wherein component

        (c) consists essentially of molecules selected from
        the group consisting of cetyl alcohol, stearyl
        alcohol, and monoesters of glycerol, sorbitan, and
        trimethylolpropane with saturated C14-22 aliphatic
        acids.
        - 1 12. A process according to claim 8, wherein component

          (C) consists essentially of molecules selected from

          the group consisting of cetyl alcohol, stearyl

          alcohol, and monoesters of glycerol, sorbitan, and

          trimethylolpropane with saturated C<sub>14-22</sub> aliphatic

          acids.
          - 1 13. A process according to claim 7, wherein component

            (C) consists essentially of molecules selected from

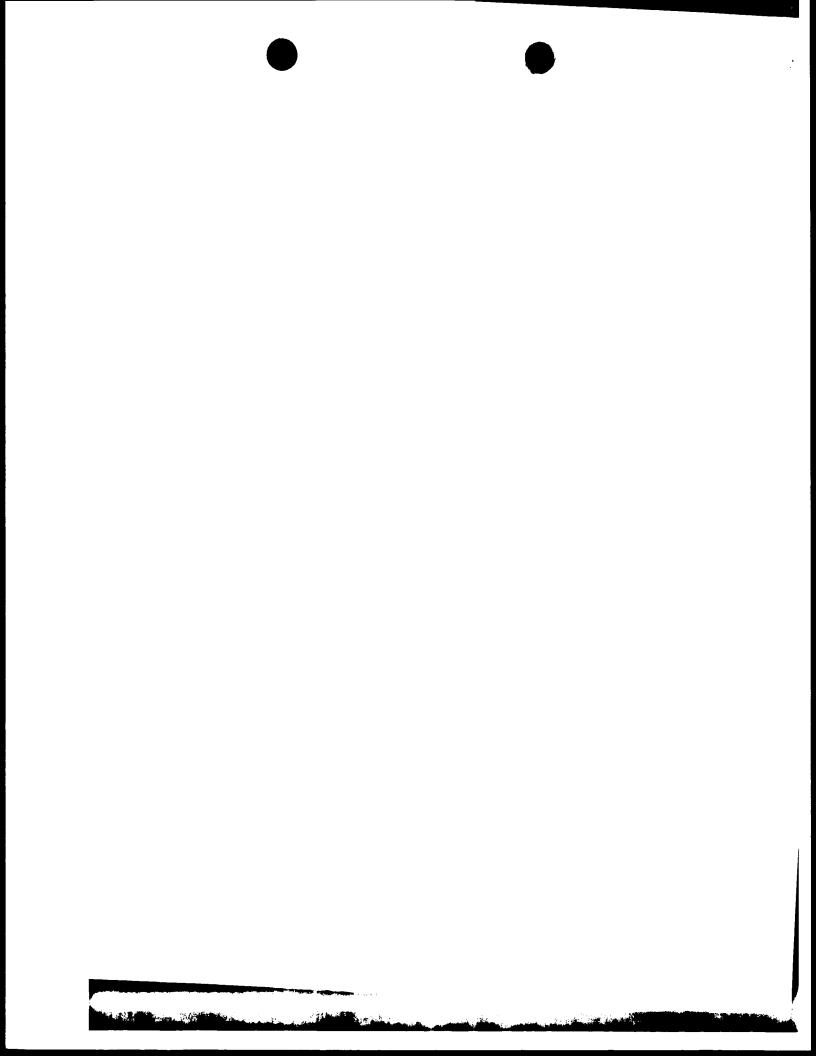
            the group consisting of cetyl alcohol, stearyl

            the group consisting of cetyl alcohol, sorbitan, and

            alcohol, and monoesters of glycerol, sorbitan, and

            trimethylolpropane with saturated C<sub>14-22</sub> aliphatic

            acids.



- 1 14. A process according to claim 2, wherein

  2 component (C) consists essentially of molecules

  3 selected from the group consisting of cetyl alcohol,

  5 stearyl alcohol, and monoesters of glycerol, sor
  5 stearyl alcohol, and monoesters of glycerol

  6 bitan, and trimethylolpropane with saturated C<sub>14-22</sub>

  6 aliphatic acids.
  - 15. A process according to claim 4, wherein component

    (C) consists essentially of molecules selected from

    the group consisting of cetyl alcohol, stearyl

    alcohol, and monoesters of glycerol, sorbitan, and

    trimethylolpropane with saturated C<sub>14-22</sub> aliphatic

    trimethylolpropane with saturated C<sub>14-22</sub> aliphatic

    acids.
    - 1 16. A process according to claim 3, wherein component

      (C) consists essentially of molecules selected from
      the group consisting of cetyl alcohol, stearyl
      the group consisting of cetyl alcohol, sorbitan, and
      alcohol, and monoesters of glycerol, sorbitan, and
      trimethylolpropane with saturated C<sub>14-22</sub> aliphatic
      trimethylolpropane with saturated trimethylolpropane with saturated C<sub>14-22</sub> aliphatic
      trimethylolpropane with saturated C<sub>14-22</sub> aliphatic
      - 1 17. A process according to claim 16, wherein the oil

        component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to
        B to C of 1: 0.1 0.3: 0.1 0.3.
      - 1 18. A process according to claim 15, wherein the oil

        1 component (A), the emulsifier (B), and the co
        2 emulsifier (C) are used in a ratio by weight of A to

        8 to C of 1: 0.1 0.3: 0.1 0.3.

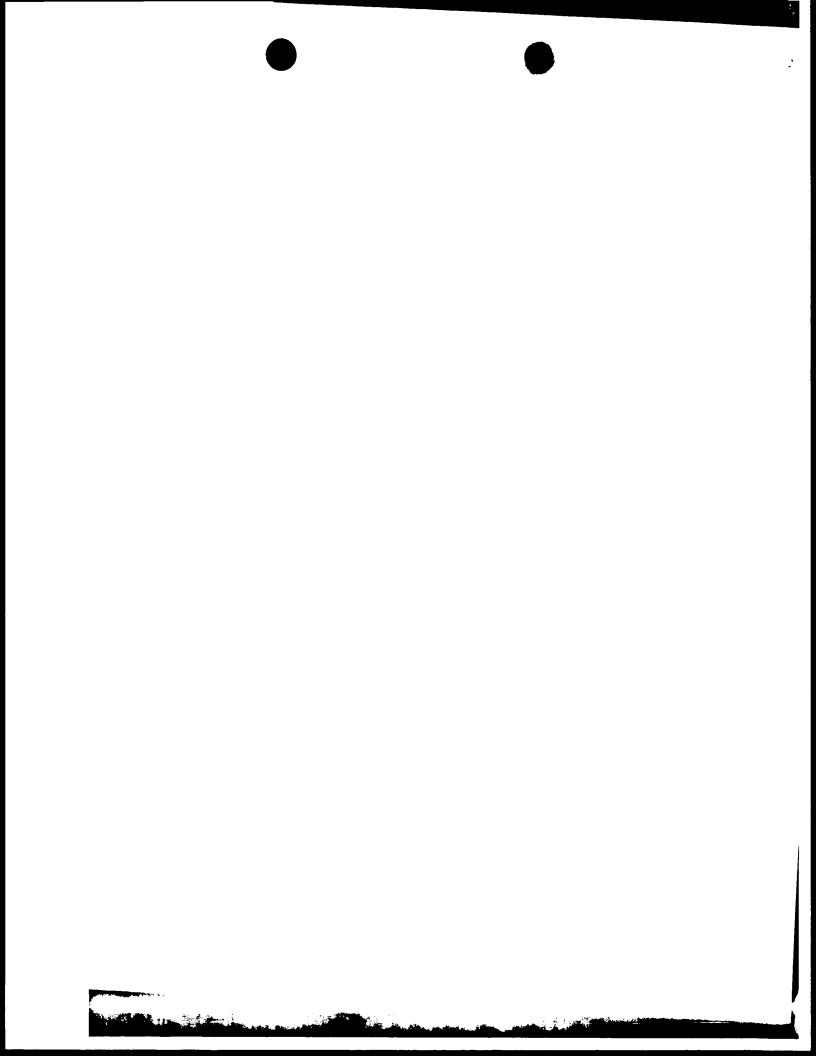
        A brocess according to claim 15, wherein the oil
        - 1 19. A process according to claim 14, wherein the oil

          1 component (A), the emulsifier (B), and the co
          2 emulsifier (C) are used in a ratio by weight of A to

          B to C of 1: 0.1 0.3: 0.1 0.3.
        - 20. A process according to claim 13, wherein the oil

          component (A), the emulsifier (B), and the co
          emulsifier (C) are used in a ratio by weight of A to

          B to C of 1: 0.1 0.3: 0.1 0.3.



- 21. A process according to claim 12, wherein the oil

  component (A), the emulsifier (B), and the co
  emulsifier (C) are used in a ratio by weight of A to

  B to C of 1: 0.1 0.3: 0.1 0.3.
  - 22. A process according to claim 11, wherein the oil

    component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to

    B to C of 1: 0.1 0.3: 0.1 0.3.

    B to C of 1: 0.1 0.3 : 0.1 0.3.
    - 23. A process according to claim 10, wherein the oil

      component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to

      B to C of 1: 0.1 0.3: 0.1 0.3.

      B to C of 1: 0.1 0.3: 0.1 0.3.
      - 24. A process according to claim 9, wherein the oil

        component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to

        B to C of 1: 0.1 0.3: 0.1 0.3.

        B to C of 1: 0.1 0.3: 0.1 0.3.
        - 25. A process according to claim 8, wherein the oil

          component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to
          B to C of 1: 0.1 0.3: 0.1 0.3.
        - 26. A process according to claim 7, wherein the oil

          component (A), the emulsifier (B) and the co
          component (C) are used in a ratio by weight of A to

          emulsifier (C) are used in a ratio by weight of A to

          B to C of 1: 0.1 0.3: 0.1 0.3.

          B to C of 1: 0.1 0.3: 0.1 0.3.
          - 27. A process according to claim 5, wherein the oil

            component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to
            B to C of 1: 0.1 0.3: 0.1 0.3.
          - B to C of 1: 0.1 0.3: Wherein the oil

            28. A process according to claim 4, wherein the oil

            28. Component (A), the emulsifier (B), and the co
            29 component (C) are used in a ratio by weight of A to

            20 emulsifier (C) are used in a ratio by weight of A to

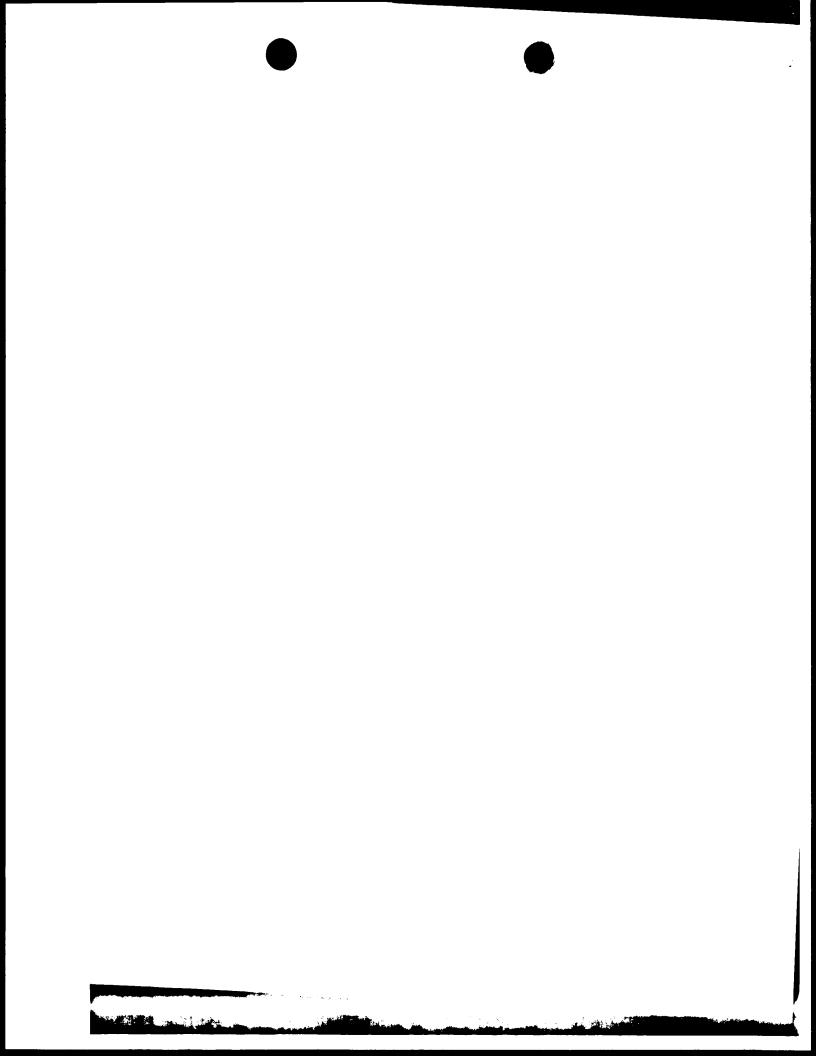
            20 emulsifier (C) are used in a ratio by weight of A to

            21 emulsifier (C) are used in a ratio by weight of A to

            22 emulsifier (C) are used in a ratio by weight of A to
          - 29. A process according to claim 3, wherein the oil

            component (A), the emulsifier (B), and the co
            component (C) are used in a ratio by weight of A to

            emulsifier (C) are used in a ratio by weight of A to



- 1 30. A process according to claim 2, wherein the oil
  2 component (A), the emulsifier (B), and the co2 emulsifier (C) are used in a ratio by weight of A to
  3 B to C of 1: 0.1 0.3: 0.1 0.3.
  - A process according to claim 30, wherein the oil

    component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to
    B to C of 1: 0.2: 0.15.
  - A process according to claim 29, wherein the oil

    component (A), the emulsifier (B), and the co
    emulsifier (C) are used in a ratio by weight of A to

    B to C of 1: 0.2: 0.15.
  - A process according to claim 28, wherein the oil

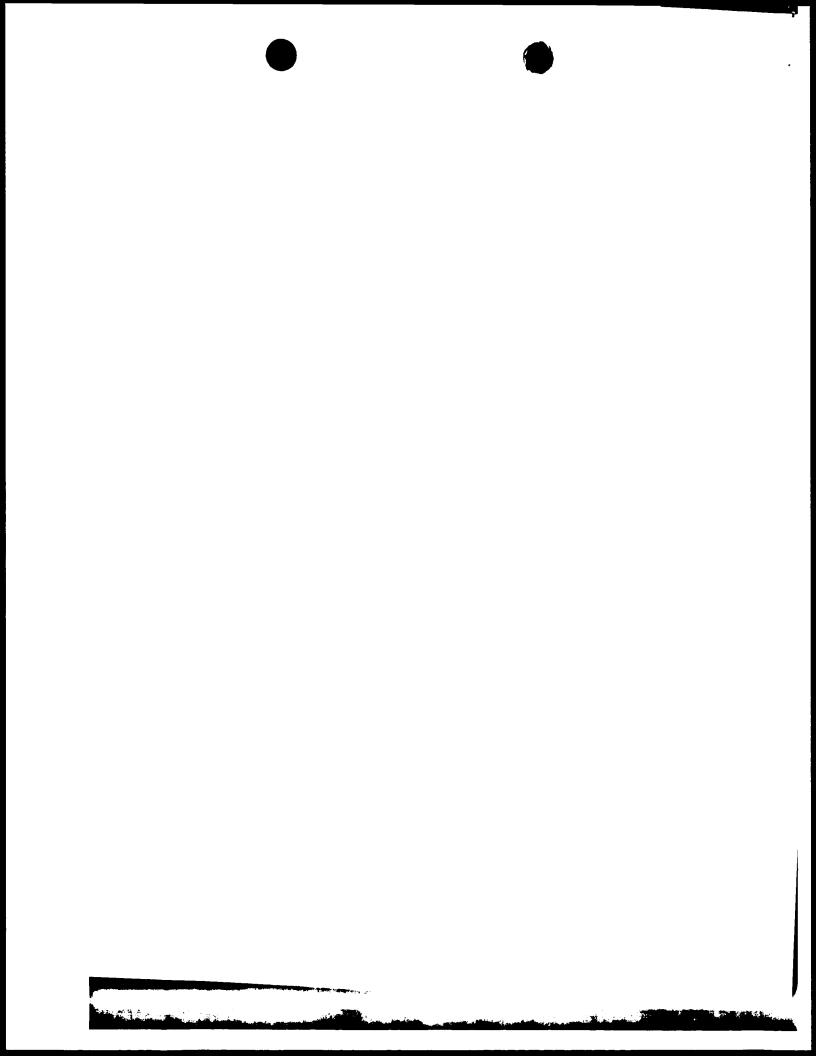
    component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to
    B to C of 1: 0.2: 0.15.
  - 34. A process according to claim 27, wherein the oil
    component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to
    B to C of 1: 0.2: 0.15.
  - 1 35. A process according to claim 26, wherein the oil
    2 component (A), the emulsifier (B), and the co2 emulsifier (C) are used in a ratio by weight of A to
    3 B to C of 1: 0.2: 0.15.
  - 1 36. A process according to claim 25, wherein the oil
    2 component (A), the emulsifier (B), and the co2 emulsifier (C) are used in a ratio by weight of A to
    3 B to C of 1: 0.2: 0.15.
  - A process according to claim 24, wherein the oil

    1 37. A process according to claim 24, wherein the oil

    2 component (A), the emulsifier (B), and the co
    2 emulsifier (C) are used in a ratio by weight of A to

    3 B to C of 1: 0.2: 0.15.
  - 38. A process according to claim 23, wherein the oil

    component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to
    B to C of 1: 0.2: 0.15.



- 1 39. A process according to claim 22, wherein the oil
  2 component (A), the emulsifier (B), and the co2 emulsifier (C) are used in a ratio by weight of A to
  3 B to C of 1: 0.2: 0.15.
  - 1 40. A process according to claim 21, wherein the oil
    2 component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to
    B to C of 1: 0.2: 0.15.
  - 4 B to C of 1

    1 41. A process according to claim 20, wherein the oil

    2 component (A), the emulsifier (B), and the co
    2 emulsifier (C) are used in a ratio by weight of A to

    B to C of 1: 0.2: 0.15.
  - 4 B to Coll 1

    1 42. A process according to claim 19, wherein the oil

    2 component (A), the emulsifier (B), and the co
    2 emulsifier (C) are used in a ratio by weight of A to

    3 B to C of 1: 0.2: 0.15.
  - 4 B to C of 1.

    A process according to claim 18, wherein the oil

    component (A), the emulsifier (B), and the coemulsifier (C) are used in a ratio by weight of A to
    B to C of 1: 0.2: 0.15.

